REMARKS

Claims 1-5, 13-16, and 18-27 are all the claims presently pending in the application. New claim 27 is added to correspond to claim 12 previously indicated by the Examiner as being allowable if rewritten in independent format.

It is noted that Applicant specifically states that no amendment to any claim herein, if any, should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

The Examiner objects to the specification and to claims 1-5, 19, and 21-26.

Claims 1-5, 13-16, and 18-26 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Claims 1-5 (and, possibly, 19) stand rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent 6, 632,379 to Mitomo et al., and claims 1 and 13 stand rejected over Mitomo claim 1, under nonstatutory obviousness-type double patenting. Claims 1 and 3-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens, et al. (U.S. Patent No. 6,670,748), further in view of JP 04021570 to Asayama et al. Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens/Asayama, further in view of US Patent 5,998,925 to Shimizu et al.

Claims 14-16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,717,353 to Mueller et al. Claims 19 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens/Asayama, further in view of US 2004/010302 to Yoneda. Claims 20 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Mueller, further in view of Yoneda.

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens/ Asayama/Yoneda, further in view of US Patent 6,095,661 to Lebens. Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Mueller/Yoneda and/or Ellens/Yoneda, further in view of US Patent 6,095,661 to Lebens.

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens/ Asayama/Yoneda, further in view of Shimizu. Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ellens/ Mueller/Yoneda, further in view of Shimizu.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention, as exemplarily defined by claim 1, is directed to a light emitting apparatus including a light emitting element with an emission wavelength in a range of 360 to 550 nm and a rare-earth element doped oxide nitride phosphor.

A part of light radiated from the light emitting element is wavelength-converted by the phosphor. The phosphor comprises a sialon system phosphor powder comprising α-sialon of 40 weight% or more and 90 weight% or less, the α-sialon being structured such that a Ca site of Ca- α-sialon represented by: $(Ca_x, M_y)(Si, Al)_{12}(O,N)_{16}$ is partially replaced by metal (M), β-sialon of 40 weight% or less, and unreacted silicon nitride of and 30 weight% or less, where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb and Er and $0.05 < (x + y) < 0.3$, $0.02 < x < 0.27$ and $0.03 < y < 0.3$.

As discussed beginning at line 19 of page 1 and more particularly beginning at line 15 on page 4, the present inventors have recognized that conventional methods of mixing LED lights to obtain colors have problems with specific colors such as red or white.

The claimed invention, on the other hand, as explained at lines 1-6 of page 5, provides a combination of elements that improve these problems specifically for red and white.

II. THE SPECIFICATION OBJECTIONS

The Examiner objects to the specification for failing to provide non-"unequivocally-defined" chemical formulas.

In response to the equation on page 22, lines 21-27, the parameters "m" and "n" were previously defined in the specification, on line 25 of page 20. Relative to the Examiner's objection for β-sialon, this compound is defined at lines 20-23 of page 20. Relative to the Examiner's interpretation of the claims 1 and 19, the Examiner's interpretation is incorrect, as explained below.

Accordingly, Applicants request that the Examiner reconsider and withdraw these objections.

III. THE CLAIM OBJECTIONS

The Examiner objected to claims 1-5, 19, and 21-26 because the Examiner has a unique and specific preference for claim language. Specifically, the Examiner requires that "40 weight % or more and 90 weight % or less" be changed to "a weight relative to total weight of the phosphor in the range between 40 weight % to 90 weight %".

In response, Applicants submit that one having ordinary skill in the art would clearly understand this claim language to which the Examiner objects and respectfully requests that the Examiner explain how *any* confusion would thereby arise, when viewed from the perspective of one having ordinary skill in the art.

As clearly stated in MPEP §2173.02: "*The examiner's focus during examination of claims for compliance with the requirement for definiteness of 34 U.S.C. 112, second paragraph is whether the claim meets the threshold requirements for clarity and precision, not whether more suitable language or modes of expression are available.... Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selection by applicant satisfy the statutory requirement.*"

Therefore, in accordance with the above-recited evaluation guideline, Applicants request that the Examiner reconsider and withdraw this objection.

IV. THE 35 USC §112, SECOND PARAGRAPH REJECTION

Claims 1-5, 13-16, and 18-26 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection.

More specifically, relative to claims 1-5, 13, 19, and 21-26, the Examiner alleges that claims 1 and 19 are indefinite because the definition of β-sialon contains metal Al but none of the metals listed in the claims.

In response, Applicants submit that the Examiner seems to fail to understand the plain meaning of the claim language, since the metals listed do not refer to the composition of the β-sialon, but, rather to the metal M in the formula listed for the Ca site of Ca-α-sialon.

Hence, Applicants submit that there is no inconsistency or indefiniteness relative to the

β-sialon.

Relative to claims 14-16, 18, and 20, the Examiner alleges that "x" lacks antecedent basis in claims 14 and 20. Applicants respectfully disagree with the Examiner's conclusion, since the phraseology used in both claims is: "a doping amount x", which clearly has proper antecedent basis structure.

Relative to the Examiner's allegation that a "... stoichiometric parameter is only definite if it defines a stoichiometric ratio of two definite material substances", Applicants submit that, to one having ordinary skill in the art, the formulas provide the information for one of ordinary skill in the art to understand the metes and bounds. This is confirmed by evaluating claim 1 in newly-cited Mitomo.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

V. THE PRIOR ART REJECTIONS

The Double Patenting Rejection Based on Mitomo

The Examiner alleges that claims 1 and 13 are unpatentable over claim 1 of newly-cited Mitomo under nonstatutory obviousness-type double patenting. Applicants respectfully disagree.

Applicants submit that the double patenting rejection fails to meet the initial burden of an obviousness rejection and, instead, merely makes a conclusory statement. If the Examiner wishes to persist in this rejection, Applicants request that the rejection be updated in view of the deficiencies listed below. Claim 1 of Mitomo clearly differs from claims 1 and 13 of the present invention, as follows:

- Relative to claim of the present Application, claim 1 of Mitomo is a composition claim and does not address an apparatus, let alone one involving a light emitting element having a specific range of emission wavelengths, does not identify a range for weight % for α-sialon, does not provide formula $(Ca_x, M_y)(Si, Al)_{12}(O,N)_{16}$, does not in any way address the final limitation beginning with "... is partially replaced by ...."provide for partial replacement by
- Relative to claim 13 of the present invention, claim 1 of Mitomo has no suggestion of

this subject matter.

The Prior Art Rejection Based on Mitomo

The Examiner alleges that Mitomo anticipates claims 1-5 (and, possibly, claim 19). Applicants respectfully disagree.

Relative to claims 1 and 19, Mitomo clearly addresses a composition, not a light emitting apparatus. Moreover, the Examiner relies upon Example 9 in column 11. The description at lines 18-20 of column 11 clearly states that this example has a light emission of 550-650 nm, not 360-550 nm, as required by the plain meaning of the claim language. The emission at line 62 of column 1 is for an unrelated phosphor and, therefore, irrelevant. This different emission wavelength only confirms that "minor" differences of the composition can cause an entirely different emission wavelength.

Hence, turning to the clear language of the claims, in Mitomo (e.g., Example 9), there is no teaching or suggestion of: "...a light emitting element with an emission wavelength in a range of 360 to 550 nm ....", as required by independent claim 1. Claim 19 has similar language.

Relative to claim 2, Example 9 of Mitomo has an emission of 550-650, not 450-550.

Relative to claim 5, the Examiner is requested to point out specific line numbers in column 1 of Mitomo that allegedly provides a group III nitride system.

For this reason alone, claims 1-5 and 19 are clearly patentable over Mitomo.

The Rejection Based on Ellens

The Examiner alleges that Ellens, when modified by Asayama, renders obvious claims 1, 3-5, when Ellens/Asayama is further modified by Simizu, renders obvious claim 2, when Ellens/Asayama is further modified by Yoneda, renders obvious claims 19 and 25, when Ellens/Asayama/Yoneda is further modified by Lebens, renders obvious claim 21, when Ellens/Yoneda is further modified by Lebens, renders obvious claim 22, when Ellens/Asayama/Yoneda is further modified by Shimizu, renders obvious claim 23, and, when Ellens/Yoneda is further modified by Shimizu, renders obvious claim 24.

Applicants respectfully disagree.

First, it appears that the Examiner fails to recognize that the present invention is

addressing a precisely defined range of wavelengths being emitted from the apparatus, with the intent of improving the quality of white light. To achieve this defined range, there are two components: a light source having a lower wavelength (e.g., starting at 360 nm) and a phosphor component that shifts light from this light source to provide an upper emission wavelength to be 550 nm.

The importance of this entire range is that, as explained on pages 1-4, white light from conventional displays can suffer either because it is weak in red light (e.g., at the low end of the range) or because the light source is poorly matched to the shift of the phosphor material.

The present invention overcomes this quality in white light by providing a light source having improved lower wavelength as matched to an improved phosphor matched for the upper wavelength.

Thus, contrary to the evaluation currently of record, the plain meaning of the claim language is not satisfied by having "... *a range of 300 nm to 485 nm substantially overlapping the claimed range* ...", since Applicants are entitled to assert that their invention improves white light by providing the entire precisely-defined emission range of the apparatus.

For this reason alone, the above-identified claims are clearly patentable over Ellens, since the plain meaning of the independent claim is not satisfied by the emission range from Ellens. None of the secondary references overcome this basic deficiency of Ellens.

Hence, turning to the clear language of the claims, in Ellens there is no teaching or suggestion of: "....a light emitting element with an emission wavelength in a range of 360 to 550 nm ....", as required by independent claim 1.

Relative to modifying Ellens by the various secondary references, Applicants submit that the rejection currently of record provides no reasonable motivation as taught in the references themselves. Rather, the rejection merely uses the claimed invention as a roadmap to demonstrate that alleged missing elements are known in the art and the novel combination is, therefore, possible using known elements. However, as explained in MPEP §2143.01, this analysis approach does not provide a *prima facie* obviousness rejection: "*The mere fact that reference can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.*" (emphasis in MPEP itself)

Along this line, it is noted that the secondary reference Lebens teaches the mechanism

of controlling the pulse widths of two LEDs for mixing colors. It does not teach or suggest the mechanism of the present invention of controlling the pulse of the light source relative to the emission of the phosphor color.

The Rejection Based on Mueller

The Examiner alleges that Mueller renders obvious claims 14-16 and 18, when Mueller is modified by Yoneda, renders obvious claims 20 and 26, when Mueller/Yoneda is further modified by Lebens, renders obvious claim 22, and, when Mueller/Yoneda is further modified by Shimizu, renders obvious claim 24.

However, Applicants submit that the same deficiency identified above for Ellens exists for Mueller in that the entire, precisely-defined range of emission of the claimed invention is conceded by the Examiner as not being present in Mueller. It is irrelevant that the Examiner considers that Mueller "substantially overlaps" this precisely-defined range, since a white light resultant from Muller will not have the improved quality of the present invention.

Even more significant, Mueller fails to disclose the crystal structure, i.e., no description as to whether its phosphor is alpha or beta-sialon. As a matter of fact, the phosphor emits green light by being excited with an excitation light with a wavelength of UV to blue (col. 2, lines 15-22, and Fig. 1). Thus, a second phosphor to emit red light needs to be used to compose a white LED. As such Mueller is clearly different in material and function of phosphor from the present invention.

Therefore, the above-identified claims are clearly patentable over Mueller, for the same reasons identified above for Ellens.

The Shimizu et al. reference

Shimizu discloses only a phosphor of YAG activated with cerium, etc. Thus, the phosphor material of Shimizu is clearly different from the present invention.

The Asayama reference

Asayama only relates to a method of producing a sintered body of beta-sialon by using silicon nitride as a starting material. Thus, the sintered compact of Asayama does not have any luminescence property.

VI. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-5, 13-16, and 18-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance.

The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 4/20/06

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